REMARKS

Applicant respectfully request reconsideration of Claims 15-20 which stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Rieber patent in view of the Hirs patent for the reasons cited by the Examiner. For the following reasons, the Applicant believes the rejection of these claims is not valid.

Claims 15-20 claim a method of stacking crumb rubber in a downflow filter such that such that the crumb rubber particles near the bottom of the downflow filter are compressed under weight of the crumb rubber particles stacked towards the top of the downflow filter and porosity between the crumb rubber particles decrease through the down flow filter from the top to the bottom of the downflow filter due to pressure on each of the crumb rubber particles on each other. The specification discusses and shows that the use of the crumb rubber in the manner claimed provides a filter with improved efficiency and in the Background points out one of the purposes of the Applicant's invention is to provide a reusable filter that it can be easily backwashed without destroying the properties of the filter.

The main purpose of the Rieber patent is to increase the heat value of a filter cake and therefore teaches the use of rubber only as an acceptable material to be burned as fuel. The Rieber patent discusses throughout the specification and claims that the rubber particles are being substantially uncompactable and dimensionally stable, **for example in claim 1**. Since the Rieber patent does not discuss the type of filter used, one must assume that it is the type whereby the rubber does not compress under its own weight, so that it remains uncompactable and dimensionally stable, **which indicates an upflow or cross flow filter.**

Applicant believes that the Rieber patent is describing a filtration technology that is surface filtration. In surface filtration, contaminant particles are primarily removed by physical straining at the filter surface (by pores the fine rice hull ash layer). A filter cake will be produced by the filtration process. The filtration described in the current application is an in-depth filtration. In-depth filtration involves flocculation, sedimentation interception and physical straining. No filter cakes will be produced as the filter is backwashed for reuse. The

crumb rubber used in the Rieber patent is used as a filter aid. The fine rice hull ash is used as the filter media for surface filtration. Rice hull ash, diatomaceous earth, or other fine filter media must be used for an effective filtration. In the current application, crumb rubber is the filter media for an effective in-depth filtration. No fine Rice hull ash and diatomaceous earth are needed for the filtration for the filter in the current application.

Therefore, the Rieber patent does not teach or even suggest and if fact teaches away from using crumb rubber particles stacked towards the top of the downflow filter and porosity between the crumb rubber particles decrease through the down flow filter from the top to the bottom of the downflow filter due to pressure on each of the crumb rubber particles on each other. **The Rieber patent teaches away from the current application by claiming that the rubber should not be compacted.** The Rieber patent does not teach or even suggest only using crumb rubber particles. The Rieber patent does not teach or even suggest using crumb rubber particles in a filter to be cleaned and reused.

The Hirs patent describes a downflow filter with layers of various granular materials. All granular materials described in the Hirs patent, including granulated shells of black walnut, granulated anthracite coal, and sand, are rigid materials. These materials can not be compressed. For all rigid filter media, a reverse porosity will be resulted after a backwash, as shown in attached Figure 1 (b). This reverse porosity will greatly affect the filtration efficiency of a granular medium filter. The Hirs patent describes a typical tri-media or multi-media filter. By using various materials, the reverse porosity in Figure 1 (b) can be partially avoided. This is done by using a large size of black walnut shell media, medium size of anthracite media, and small size of sand media. Because of the low density of black walnut shell and the high density of sand, the large black walnut shell media will stay on the top of the filter and the small sand media will stay at the bottom of the filter, which is partially similar to the porosity in an ideal filter, as shown in Figure 1 (a). However, the porosity inside each layer of the tri-media filter, which is described in the Hirs patent, is still same as the porosity in a real filter, as shown in Figure 1 (b). This indicates that the filter described in the Hirs patent is far from an ideal filter. The crumb rubber filter described in the current application is completely different from the

one described in the Hirs patent. Crumb rubber media stacked so that it compresses, due to media weight and hydraulic force, as shown in Figure 1 (c). This porosity distribution is similar to that in an ideal filter, as shown in Figure 1 (a). This porosity will be same after a backwash. The porosity distribution in a crumb rubber filter will greatly improve the filtration efficiency.

Therefore, the Hirs patent does not teach or even suggest and in fact teaches away from using crumb rubber particles stacked towards the top of the downflow filter and porosity between the crumb rubber particles decrease through the down flow filter from the top to the bottom of the downflow filter due to pressure on each of the crumb rubber particles on each other, as the Hirs patent teaches using materials that do not compress.

Hence, applicant believes that the rejection of claims 15-20 under U.S.C. § 103(a) is invalid, as both references actually teach away from the method claimed. Applicant believes that the Examiner has not met the duty to show the incentive to combine the teachings of the Rieber and Hirs patents under the U.S.C. § 103(a) rejection. In *Ex parte* Skinner, 2 USPQ2d, 1788, 1790 (B.P.A.I. 1986), The Board explained:

> When the incentive to combine the teachings of the reference is not readily apparent, it is the duty of the examiner to explain why combination of the reference teachings is proper....Absent such reason or incentives, the teachings of the references are not combinable.

Take for example this hypothetical. If a user has a choice of using a media that is close by and less expensive then crumb rubber, why would the user choose crumb rubber, unless the user knew that the crumb rubber provided improved results. Neither reference or the combination of the references teaches using crumb rubber in the manner claimed in claims 15-20.

The Examiner may argue, as he has in a telephone interview, that the claimed manner is inherent. The use of crumb rubber in a downflow filter to provide an improved filter due to compression was unknown, until the current application was filed. In *In re Spormann*, F.2d 444, 150USPQ449 (C.C.P.A. 1966) the CCPA stated the following.

> The board apparently thought that the minimizing of sulfate production would be *inherent* in the process of Frederich et al....As we pointed out in *In re Adams...*, the inherency of an advantage and its obviousness are entirely different questions. That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.

Spormann teaches that the arguments by the Examiner based on inherent properties cannot stand when there is no supporting teaching in the prior art. Inherency and obviousness are distinct concepts. Thus, Applicant believes that the Examiner's argument of inherency can not be applied to render claims 15-20 obvious in light of the Rieber and Hirs patents.

In view of the aforementioned remarks and amendments, it is believed that claims 15-20 are in condition for allowance and allowance of these claims is respectfully requested.

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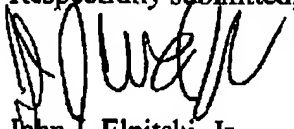
Respectfully submitted,



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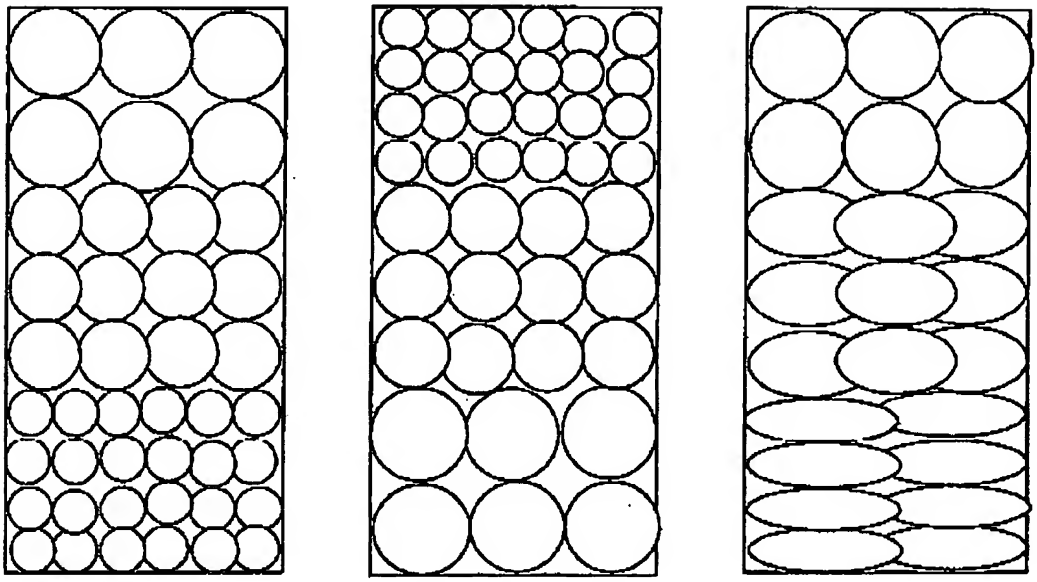

a. ideal filter b. real filter c. crumb rubber filter

Figure 1. Porosity distribution in three filters.